



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

SEP 13 2004

OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

Mr. Mike Fetherling, VP Operations  
Midwest Soil Remediation, Inc.  
1480 Sheldon Drive  
Elgin, Illinois 60120

Dear Mr. Fetherling:

This letter from the National Program Chemicals Division (NPCD) of the U.S. Environmental Protection Agency (EPA) grants Midwest Soil Remediation, Inc. (MSR) a PCB Disposal Approval to operate its mobile High Capacity Indirect Thermal Desorption Unit (HCI TDU), a polychlorinated biphenyl (PCB) alternative thermal disposal method. Enclosed is an approval, entitled "Approval to Dispose of Polychlorinated Biphenyls (PCBs)," authorizing MSR to remove PCBs from soil, subject to the conditions of approval listed in the Enclosure. This approval is issued pursuant to Section 6(e)(1) of the Toxic Substances Control Act (TSCA) of 1976 (Public Law 94-469), and the Federal PCB Regulations, 40 CFR Part 761.60(e) (48 FR 13185, March 30, 1983). Effective dates for this approval begin on September 15, 2004 and terminate on September 15, 2009.

This approval authorizes MSR to remove and dispose of PCBs from contaminated soil. It is effective on a nationwide basis. MSR demonstrated the HCI TDU at the Warren County PCB Landfill Site in Warrenton, North Carolina during the week of January 5, 2003. Final results of the demonstration were submitted April 4, 2003. Stack sampling data indicated that the HCI TDU complied with the PCB emission standard for incinerators, 99.9999% destruction and removal efficiency (DRE). PCB DREs for three demonstration tests were 99.9999988%, 99.9999987% and 99.9999996% corresponding to PCB emission rates of  $4.86\text{E}-08$ ,  $1.19\text{E}-07$ , and  $5.05\text{E}-08$  grams/second (g/sec). Dioxin and furan emissions expressed as 2,2',4,4'-tetrachlorobiphenyl TEQ (toxic equivalent quotient) ng/dscm (nanogram/dry standard cubic meter) concentrations were  $<0.000307$ ,  $<0.00135$  and  $0.0111$ . Emission rates for dioxins and furans expressed in g/sec TEQ were  $1.68\text{E}-14$ ,  $6.75\text{E}-14$  and  $5.06\text{E}-13$ . Whenever MSR performs a stack sampling test upon request or as required by EPA or other agencies, an interim dioxin/furan TEQ emission concentration of 1 ng/dscm is imposed. This dioxin/furan emission requirement will be addressed when the RCRA dioxin/furan standards is established for alternative thermal technologies.

NPCD imposes two site-specific conditions in the approval. The first involves the carbon adsorption units which are major components of the air pollution control system (APCS) and the aqueous condensate stream. As the HCI TDU operates, the carbon becomes saturated with



Recycled/Recyclable  
Printed with Soy/Canola Ink on paper that  
contains at least 50% recycled fiber

organic compounds and must be replaced. The frequency of replacement is dependent on the quantity and the type of the organic makeup of the site soil. MSR developed a technique to monitor the vapor phase carbon adsorption effectiveness, using a method approved by EPA and other agencies for detection of PCBs. The detector is placed between the primary and secondary carbon adsorption units. When PCBs are detected, the primary unit is removed, the secondary unit replaces the primary unit, and a new secondary unit is put into service. PCB detection must be recorded in the operating records of the HCI TDU, and the adsorption units must be replaced.

As an alternative to the monitoring of the Primary Carbon Unit for PCB by periodic sampling of the gas stream, MSR may develop a system using the heat of adsorption to estimate the activity of the carbon. By correlating the temperature difference ( $\Delta T$ ) between the incoming and exiting gas to the saturation point of the Primary Carbon Unit, MSR may use this  $\Delta T$  as an indicator to activate the gas sampling monitoring procedure (Condition 3(b)(2)(B))

The second site-specific condition involves the soil or product treatment temperature. MSR demonstrated acceptable treatment conditions during the Warren County Landfill PCB Demonstration. Product exit temperatures ranged between 753°F to 802°F. Although this site was successfully treated with soil temperature neighboring 750°F and above, soil with high clay and organic content may require more aggressive conditions for PCB removal. Thus, establishing a site-specific treatment temperature requires testing and analysis of the treated soil (Condition 3(a)(2)).

MSR must establish at each site, carbon replacement frequency and soil treatment conditions prior to full remediation operations. These conditions must be based on site-specific data. Analytical results and rationale must be readily available for review by EPA and its designated agents. See Condition 3.a of this Approval for details.

Please note that Condition 18 "Financial Assurance" of the approval requires MSR to submit a closure plan and financial assurance instrument prior to start up of TSCA operation. In addition, MSR is required to submit to the Chief, Fibers and Organics Branch, annual updates of the closure plan and financial assurance instrument.

This approval may be modified, withdrawn, or further conditions may be added at any time EPA has reason to believe that the operation of the HCI TDU presents an unreasonable risk of injury to health or the environment. Withdrawal of the approval or imposition of further conditions may also result from future EPA rulemaking with respect to PCBs, or from new information gathered by MSR at a demonstration site or during subsequent jobs at other sites. Moreover, violation of any condition of this approval may subject MSR to enforcement action, suspension and/or termination of this approval.

Finally, this approval is based upon the conclusion by EPA that the HCI TDU, when operated in accordance with the conditions of approval, does not present an unreasonable risk of injury to health or the environment.

The MSR HCI TDU process is described in documents for a TSCA PCB disposal demonstration and operating permit submitted to NPCD entitled "Permit Application for a Mobile PCB Treatment Unit" dated June 25, 2001, and "Demonstration Test Plan: High Capacity Indirect Thermal Desorption Unit with Optional Chemical Decomposition System" dated October 5, 2001.

If you have any questions regarding this matter, please contact Hiroshi Dodohara at (202) 566-0507.

Sincerely,

A handwritten signature in cursive script, appearing to read "Maria J. Doa".

Maria J. Doa, Ph.D., Director  
National Program Chemicals Division

Enclosure

cc: PCB Coordinators  
USEPA, Regions I - X

Carl Palmer  
TD\*X Associates, Inc.

Carl Swanstrom  
Midwest Soil Remediation, Inc.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF MIDWEST SOIL	)	APPROVAL TO DISPOSE
	)	
REMEDIATION, INC. OF ELGIN,	)	OF POLYCHLORINATED
	)	
ILLINOIS	)	BIPHENYLS (PCBs)

AUTHORITY

This approval is issued pursuant to Section 6(e)(1) of the Toxic Substances Control Act of 1976 (TSCA), Public Law No. 94-469, and the Federal PCB Regulations, 40 CFR 761.70 (44 FR 31542, May 31, 1979; 47 FR 19527, May 6, 1982; 48 FR 13185, March 30, 1983; 49 FR 28191, July 10, 1984; 53 FR 12524, April 15, 1988). Background and Findings related to this approval are attached as Appendix I and II.

Midwest Soil Remediation, Inc. (MSR) is the sole owner and operator of a process known as the High Capacity Indirect Thermal Desorber Unit (HCI TDU) which thermally removes PCBs from contaminated soil. Pursuant to 40 CFR 761.60(e), the Environmental Protection Agency (EPA) finds that the HCI TDU, MSR's thermal desorption process (when operated in accordance with the conditions of this approval) does not pose an unreasonable risk of injury to health or the environment.

EFFECTIVE DATE

This approval to operate nationwide shall become effective on September 15, 2004 and expire on September 15, 2009.

FOREWORD

If any administrative or procedural requirement of this approval has been satisfied by other parties (e.g., completion of a risk assessment, financial responsibility for a specific site), MSR is relieved of that requirement. MSR shall remain responsible for operational requirements; e.g., sampling of soil feedstock even though the site has been well characterized for PCB concentration.

CONTENTS

Definitions  
Conditions  
Approval  
Appendix  
    I. Background  
    II. Findings

## DEFINITIONS

"Analytical data" means (a) a formal report from a chemical analysis laboratory or (b) appropriate chemical instrument print outs with appropriate controls, standards, and written instrumental operating parameters and conditions or (c) a statement that the "assumption" rule has been used. Technical judgement or experience is not considered analytical data.

"Appropriate local jurisdiction" means the incorporated city where the High Capacity Indirect Thermal Desorption Unit will be operated, or the county, if the High Capacity Indirect Thermal Desorption Unit will be operated outside the boundary of an incorporated city.

"Business hours" means 8:00 a.m. to 5:00 p.m. local time on weekdays except United States Government Holidays.

"Change in scale" means a 50% increase or more of the volume of Waste Feed notified to be treated at a facility.

"Day" means a calendar day, unless otherwise specified.

"Duplicate analysis" means two gas chromatographic analyses of the analyte prepared from one sample of material.

"Facility" means the geographically contiguous property unit (such as a single manufacturing plant) at which the High Capacity Indirect Thermal Desorption Unit treatment/disposal operations are conducted.

"Facility location" means a street address or a directional description which would allow a facility to be found by an EPA inspector.

"Frequent facility changes" means facility changes at a rate of more than once per week.

"Job" means all High Capacity Indirect Thermal Desorption Unit treatment/disposal operations for a single customer within fifty road miles of a central location. A job may consist of High Capacity Indirect Thermal Desorption Unit treatment/disposal operations at several different facilities for a single customer.

"Lifetime exposure risk" means the risk to an average adult individual who is exposed to a stated average concentration of a toxic material daily over the course of a 70 year lifetime.

"Lost time injury" or "Lost workday injury" means an injury related to the operation of the High Capacity Indirect Thermal Desorption Unit process which results in an employee not performing his/her normal assignments during the workday and/or any successive workday(s) following the day of the injury.

"Major modification" means any change to capacity, design, or efficiency of the High Capacity Indirect Thermal Desorption Unit or process, change of waste type, or any other changes significantly affecting overall performance or environmental impact.

"Minimal," with regard to an amount of PCB wastes means less than ten percent (10%) of total wastes treated.

"Mobile operations" means those operations where the High Capacity Indirect Thermal Desorption Unit mobile unit remains at a facility for less than 180 consecutive days.

"Non-soil" solids and materials include non-pumpable sludge and sediment. Non-soil solids includes soil with greater than 35% water. Typically, non-soil may include solids such as lake and river sediment, ashes, mill tailings which exhibit non-pumpable characteristics.

"Operations" means the process of treating PCBs, including start-up of the High Capacity Indirect Thermal Desorption Unit, preparation of hazardous waste feed, including PCBs, and decontamination of the High Capacity Indirect Thermal Desorption Unit and supporting components at termination of treatment, as well as actual treatment.

"OPPT" means the Office of Pollution Prevention and Toxics (7401); (202) 260-3815; Fibers and Organics Branch (7404T); (202) 566-0500; Facsimile (202) 566-0473.

"PCB" means polychlorinated biphenyls as defined in 40 CFR 761.3.

"PCB release" and "PCB spill" have the same meaning as "spill" as defined in EPA's PCB Spill Cleanup Policy in 40 CFR 761.123.

"Permanent operations" means those operations where the High Capacity Indirect Thermal Desorption Unit mobile unit remains at a facility for 180 consecutive days or longer.

"Process Failure" means the inability of the High Capacity Indirect Thermal Desorption Unit (HCI TDU) to treat the feedstock for reasons other than contaminants (such as chlorinated solvents).

"Remediation site" or "site" means the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of a cleanup of PCB remediation waste regardless of whether the site was intended for management of waste.

"Sludge" is defined as non-liquid, non-soil materials from industrial and commercial operations such as tanks, lagoons and ponds. These material are also referred to as "non-soil solids." Sludge from non-industrial and non-commercial locations are not included in this definition but are addressed in Condition 2.

"2 ppm PCBs" treatment criterion is defined as follows: (a) When Aroclor patterns are detected in the chromatogram of treated material, the Aroclor will be quantified using Method 8082 (or EPA-approved equivalent method, e.g. Method 680), then the criterion for PCBs in the treated sample is "less than 2 ppm total PCBs (as calculated by comparison of total areas or height to an external Aroclor standard having a similar pattern to the sample," or (b) When Aroclor patterns do not exist, the sample will be quantified using the Dry Color Manufacturing Association (DCMA) standard, or another method approved by EPA, then the criterion is "less than 2 ppm per PCB congener (or per resolvable gas chromatographic peak, as calculated by comparison to an external standard homolog peak having the nearest retention time to each appropriate PCB peak to be quantified)."

"3 ppb PCBs" treatment criterion is defined as follows: (a) When Aroclor patterns are detected in the chromatogram of treated material, the Aroclor will be quantified using Method 8082 or another method approved by EPA, then the criterion for PCBs in the treated sample is "less than 3 ppb total PCBs (as calculated by comparison of total areas or height to an external Aroclor standard having a similar pattern to the sample);" or (b) When Aroclor patterns do not exist, the sample will be quantified using the method using the Dry Color Manufacturing Association (DCMA) standard, or another method approved by EPA, then the criterion is "less than 3 ppb per PCB congener (or per resolvable gas chromatographic peak, as calculated by comparison to an external standard homolog peak having the nearest retention time to each appropriate PCB peak to be quantified)."

"Year" means 365 days.

## CONDITIONS OF APPROVAL

Midwest Soil Remediation, Inc. (MSR) specializes in on-site removal and treatment of contaminated soil. The company is located in Elgin, Illinois. On behalf of MSR, TD\*X Associates of Research Triangle, North Carolina submitted the TSCA PCB Disposal Approval Application and Demonstration Plan pursuant to 40 CFR 761.60(e) for an alternative PCB disposal technology. The MSR TSCA Permit Application (operating permit) and Demonstration Test Plans were submitted June 25, 2001 and October 5, 2001, respectively.

MSR demonstrated their High Capacity Indirect (HCI) Thermal Desorption Unit (TDU) for approval to dispose of PCBs during the week of January 5, 2003 at the Warren County PCB Landfill, Afton, North Carolina, in the vicinity of Warrenton. Three tests were successfully completed. Therefore, NPCD authorizes MSR to operate the HCI TDU to remove PCBs in soil under conditions and restrictions contained in the following paragraphs.

### 1. Advance Notification

#### a. Overview.

MSR shall provide a nonconfidential, advance written notification of intent to operate which must be received by the addressees (as described below) prior to the conduct of a permitted PCB disposal activity. The addressees shall include, at a minimum: The appropriate EPA regional office, the appropriate state agency, and the appropriate local jurisdiction.

The written advance notification requirements are divided into two categories based on the length of time MSR is at a single facility. In general, categories are defined below and advance written notification requirements follow:

#### Mobile Operations

Those operations where the HCI TDU unit remains at a facility for less than 180 consecutive days.

#### Permanent Operations

Those operations where the HCI TDU unit remains at a facility for 180 consecutive days or longer.

The information which must be included in the advance written notification for each category is described in sections 1.b.- d. below. Advance notification requirements may be waived at Superfund sites according to § 121(e) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and its implementing provisions at (40 CFR 300.400(e)).

b. Mobile Operations

The following information must be included in a 30-day advance written notification under 1.a. The information is provided for public information purposes and for facilitating scheduling of government compliance monitoring and oversight of PCB treatment/disposal operations.

- A. Company identification: MSR's and client contacts' names and telephone numbers.
- B. Names, titles, addresses, and telephone numbers of the addressees required to be notified by 1.a.
- C. The nature of the PCB treatment/disposal activity, including estimates of the amount and type of PCB material to be treated (e.g., soil, sludge, sediment, dielectric fluid, hydraulic oil, heat transfer oil) and estimates of the concentration of PCBs in the material. The estimates shall be based on any one or combination of the following:
  - i. Analytical data or the results of analytical data provided by the customer; or
  - ii. MSR analytical data; or
  - iii. A statement that the customer has applied the "assumption rule" codified at 40 CFR 761.3 defining PCB-Contaminated Electrical Equipment.

---

EPA CONTACTS

<u>Name, Region</u>	<u>Contact Number</u>	<u>Telefax Number</u>
Hiroshi Dodohara, EPA Hq.	(202) 566-0507	(202) 566-0473
Kim Tisa Region I	(617) 565-3257	(617) 565-4939
Dan Kraft, Region II	(908) 321-6669	(908) 321-6788
Kelly Bunker Region III	(215) 814-2177	(215) 814-3114
Craig Brown Region IV	(404) 562-8990	(404) 562-8972
Tony Martig, Region V	(312) 353-2291	(312) 353-4788
Lou Roberts, Region VI	(214) 665-7579	(214) 665-7446
Mazzie Talley, Region VII	(913)-551-7518	(913) 551-7065
Dan Bench, Region VIII	(303) 312-6027	(303) 312-6409
Max Weintraub, Region IX	(415) 947-4172	(415) 947-3583
Dan Duncan, Region X	(206) 553-6693	(206) 553-8509

---



D. The facility location(s) and a telephone contact(s).

E. The time(s) and date(s) the PCB treatment/disposal activity is scheduled to take place.

An acceptable sample form for the 30-day advance written notification of intent to operate under mobile operations is included as Appendix II A.

c. Requirements for Changing from Mobile Operation Mode to Permanent Operation Mode

Whenever an HCI TDU activity originally projected to be a Mobile Operations, at some point before 180 consecutive days into the operations MSR determines that the unit will be located at the facility for 180 consecutive days or longer, MSR must proceed as follows:

- (1) MSR must immediately provide written and telephone notification of this change to the EPA Headquarters' Office of Pollution Prevention and Toxics (OPPT) and the appropriate EPA regional office.
- (2) The EPA Regional Administrator (RA) shall determine whether MSR must cease PCB treatment/disposal operations after the 180th consecutive day. The RA shall also decide whether MSR must provide OPPT and the EPA regional office a Site Evaluation, and also determine the scope of the Site Evaluation, which may include all information prescribed in sections 1.d(1) and 1.d(2) below.
- (3) The RA shall determine whether public participation shall be instituted. If required, the Site Evaluation must first be approved. Then MSR must provide for public notice only or followed up by a 30-day comment period along with an opportunity for a public meeting or hearing as described in section 1.d(3) below.

When the comment period is concluded, the regional office and OPPT will determine, in its discretion, that operations may proceed beyond 180 consecutive days. EPA will notify MSR in writing of its approval to operate beyond 180 consecutive days.

d. Permanent Operations

For projects estimated to extend for 180 days or longer at a single site, MSR must submit an advance written notification of permanent operations to the addressees at least 180 days in advance of the proposed Permanent Operations at a site. If all requirements in Conditions 1.d.(2) and 1.d have been completed, either by MSR or by other entity(s), then MSR may submit the advance notification 45 days in advance of mobilization. When a MSR HCI TDU unit is to be operated at a site for 180 consecutive days or more, the following information must be included

in the notification and verified by EPA to conform to the informational requirements before the 180-day review period can begin. This advance written notification shall include the following:

- (1) All information required under items 1.b of Mobile Operations.
- (2) Site Evaluation

The RA shall determine whether a Site Evaluation must be submitted. The Site Evaluation must be submitted to OPPT and the appropriate EPA region as part of the notice of intent to operate a permitted mobile disposal unit (MDU) at a site for 180 consecutive days or longer.

There are a number of details which were submitted to EPA as part of the original PCB disposal permit application which must be updated or revised. All of these details are directly or indirectly related to the site of operations.

#### A. Project Personnel

A list of names and an organizational chart, brief job description, and responsibilities for all staff to be employed by the permittee at the proposed facility. Job qualifications and training must be included. In addition, names, mailing addresses, and telephone numbers of primary MSR contacts with EPA, such as environmental affairs managers or government liaison contacts. Personnel training including the time, frequency and content must be included.

#### B. Facility Description

The facility description shall include details of the treatment/disposal operations as they apply to the physical layout at the disposal facility. To be included are (1) a facility layout, to scale, of the location where operations will occur, and (2) the location of safety equipment, including but not limited to fire protection equipment, disposal equipment, supplies, waste handling equipment, waste loading and unloading points for transportation, flood proofing protection structures, security structures.

If the treatment/disposal operation will be at a previously developed facility, in addition to the above requirements, facility modifications must be described and justified. Buildings for personnel, construction, maintenance and laboratories are exempted, unless there are discharges from operations of a mobile unit to the environment. Any area that may be associated with any contact with PCBs or any hazardous waste handled or generated as the result of PCB disposal must be discussed, e.g., laboratory vents and sewer discharges from the laboratory. Also, discussions shall be included of all storage facilities and their containment, process water systems, and other

waste stream processing.

C. Disposal Activities to Be Conducted On-Site

A summary of the process operations which are described in detail in the original permit application shall be submitted, not to exceed one typewritten single spaced page. The permittee shall discuss activities and the amount of time involved in setting up and taking down disposal operations of the MDU at the site. Also, the permittee shall provide a discussion of: monthly and annual amounts and concentrations of waste and amount of PCBs to be processed; amounts and concentrations of PCBs and other hazardous materials stored on site; amounts and concentrations of contained, controlled, and fugitive emissions of toxic and non-toxic materials and how contained materials will be disposed of; proposed hours of operations; expected duration of disposal activities at the site; and amounts of waste generated during the entire operation and how that waste will be disposed of.

D. Safety Measures

The permittee must describe systems and/or structures for the detection and/or containment of leaks and hazardous wastes/by-products, including process shutdowns resulting from automated monitoring of process emissions. A brief discussion must be included of the automatic process controls, such as those which control extreme temperature and pressure fluctuations or departure from a permitted range, must be included. The location and action plans for all other emergency equipment shall be provided. Maintenance plans and schedules shall be provided. Safety and/or quality control/quality assurance inspection schedules, procedures, and record keeping must be detailed.

E. Emergency Preparedness and Contingency Plans

Emergency preparedness plans, including spill prevention control and countermeasures (SPCC), must be submitted to local authorities and approved by the EPA region. These plans shall include (1) exactly what actions take place for each level of problem, (2) the names of the persons responsible for handling expected problems, and (3) facility personnel names and appropriate phone numbers for 24-hour a day contact in the event of an emergency. Frequent problems and reasonable worst case problem scenarios must be addressed. Examples are: spills during processing, storage, and transportation; fires; floods; and equipment malfunction resulting in personal injury must be addressed. The information shall include (1) names and phone numbers of fire, police, medical emergency contacts, and (2) training sessions, documents, or other information

provided to these services.

F. Transportation Routes and Volumes to be Transported to the Facility

Transportation route information shall be detailed if such routes include any roads other than interstate highways. Information shall include residential or commercial areas associated with the roads to be used by hazardous waste transporters. Amounts, volumes, and locations of off-site PCB materials which are proposed to be transported to the PCB disposal facility shall be listed. Information on the off-site and on-site storage of the off-site materials (including but not restricted to location, brief description of the release control/containment measures at the storage facility, and the estimated time to be stored at the location), shall also be listed.

G. Financial Assurance and Closure

The permittee shall summarize the financial assurance and closure provisions from the permit application including what situations are covered by insurance or other financial assurance and the amount of the assurance. Additional financial assurance and closure provisions for the time of extended PCB disposal operations at the facility must be described in detail. MSR must include site cleanup procedures and copies of any bonds which may be required by a state or local authority or by the client for the MSR operations.

H. Exposure Assessment

An exposure and risk assessment shall be provided for activities included in normal operations and in the event of reasonable worst case accidents/problems. The exposures shall include those resulting from: storage, contained and fugitive emissions, handling and processing PCBs and other hazardous waste/process materials, operation of industrial equipment, and transportation related releases such as spills and collisions.

The information shall include an assessment of risk to the public from:

- i. lifetime exposure to process operations;
- ii. the transport of PCB waste to the facility; and,
- iii. on-site storage of PCB waste for disposal.

Situations which are not considered reasonable worst case situations are a double tornado, a terrorist attack, a nuclear strike, a plane crash into the

facility, a meteor strike, and damage from an earthquake when there is not an active major geological fault near enough to expect major plant facility damage and release of PCB material.

### (3) Public Participation

The RA shall determine whether public participation shall take the form of a public notice only or public notice followed by a 30-day comment period with public review of appropriate permit related documents such as (the sanitized non-confidential business information permit application, any existing PCB disposal permit, any existing draft revised PCB disposal permit, and the Site Evaluation). The notice shall also advise that, if EPA determines that there is sufficient public interest, a public meeting will be held on a specified date and time and at a specified place not more than 45 days after the initial public notice.

After MSR has given the EPA regional office, the state agency, and the local jurisdiction a notice of intent to operate at a site for at least 180 consecutive days or more, and once OPPT and the local EPA region are satisfied that the Site Evaluation meets the requirements set forth in paragraphs 1.d(1) and 1.d(2) above, a 180-day public notification and review process shall begin.

Based on the comments and questions received during the 30-day comment period, the EPA region will determine whether a public meeting is necessary. The public meeting shall be held: (a) to discuss comments made by the public during the 30-day comment period and notification for the public meeting; (b) to allow the public to make comments on the proposed operations and facility; and (c) to allow the public to ask questions of EPA representatives on the proposed operations.

The public meeting will be hosted by the EPA region. OPPT and the EPA region may collectively determine what the schedule and the agenda for the public meeting shall be.

Not more than 150 days after the close of the public comment period, EPA shall make a decision on the authorization of Permanent Operations and on what additional conditions, if any, shall be imposed on the MSR Permanent Operations. The decision will be based on review of comments during the 30-day comment period and comments made during the public meeting. The decision could be that MSR may begin operations without additional permit conditions, or the decision could be made to require additional site-specific permit conditions which must be met before Permanent PCB Disposal Operations may begin at the facility.

2. Feedstock Restrictions: The MSR HCI TDU mobile unit is restricted to treating soil contaminated with PCBs. EPA limits MSR to a feed rate of no more than 20.1 tons per hour and PCB concentration of 2250 ppm PCBs. Operating conditions are described in Condition 3.

Prior to treatment, the PCBs must be characterized for Aroclor type and concentration. The PCBs must be sampled and analyzed by gas chromatography for PCBs in accordance with the MSR demonstration plan and procedures published by EPA:

"Guidelines for PCB Destruction Permit Applications and Demonstration Test Plans for PCB Incinerators,"  
May 28, 1986;

Quality Assurance and Quality Control Procedures for Demonstrating PCB Destruction in Filing for an EPA Disposal Permit," USEPA, June 28, 1983 (Draft);

"Recommended Analytical Requirements for PCB Data Generated On Site During Non-Thermal PCB Destruction Tests", USEPA, March 19, 1986 (Draft); and

"Interim Guidelines and Specifications for Preparing Quality Assurance Plans", QAMS-005/80, Office of Research and Development, USEPA, December 29, 1980.

Should MSR successfully demonstrate to EPA through an actual demonstration test that the HCI TDU is capable of treating higher concentrations of PCBs in soils or other media, this condition may be modified accordingly. Authorized EPA representatives must witness this demonstration and obtain appropriate split samples for verification of analytical results. MSR may conduct whatever additional analyses are necessary to characterize the waste feed and facilitate more efficient treatment (e.g., chloride content, ash content and heat of combustion/formation).

### 3. Operating Conditions and Restrictions:

#### a. Site-Specific Conditions.

##### (1) Carbon Adsorption Units Replacement Frequency:

- A. Primary or Lead Carbon Units: Prior to start up of operations, MSR must characterize each site: (i) for organic compounds including hazardous air pollutants (CAA Sect. 112), and hazardous waste constituents (40CFR 261) (see FOREWORD for applicability), and (ii) to include vegetation, for Total Organic Carbon (TOC) using Method 451.1 or an equivalent method. MSR shall use the results of this characterization to estimate the frequency of adsorptive carbon replacement for the vapor phase carbon units or the adsorptive capacity of the unit.

Frequency of monitoring for breakthrough using NIOSH Method 5503. A new unit, a newly replenished unit or a secondary unit changed to the primary position, must be monitored twice within the first three days of installation. If breakthrough is detected by the presence of PCB in the exhaust, the carbon

bed must be recharged, reloaded or the unit replaced. Thereafter, the unit shall be monitored on a monthly basis until one month prior to the estimated saturation point. Then the monitoring frequency shall be increased to a weekly basis until saturation or breakthrough is detected. A monitoring schedule must be prepared prior to beginning of operations and be made available for review by EPA or other agency representatives.

B. Secondary or Polishing Carbon Unit: Prior to starting operations at a new site, MSR must load the Polishing Carbon Unit container with fresh, new or regenerated adsorptive carbon material.

- (2) Soil Treatment Temperature: At each site, following completion of the shakedown phase, but prior to initiating "production" operations, MSR shall perform a series of tests to determine the temperature at the exit of the desorption unit. The exit temperature is a measure of the effectiveness in the removal of PCBs from soil. Testing shall continue until results from three consecutive tests are acceptable. Treated soil from tests which were unacceptable shall be disposed of in EPA-approved facilities or reprocessed in the MSR HCI TDU.

Operating conditions for these tests shall follow the provisions below:

- A. Source of the soil for the tests shall be from a stockpile or areal location containing the highest PCB levels available at the site. Test soil shall not have been treated or additives (except for water or flow enhancing substance) added prior to the tests. DRE calculations (Condition 3.b.2.H) must compensate for the addition of the flow enhancing substance, i.e., feed rate for the flow enhancing substance must be subtracted from the total soil or waste feed rate to calculate the DRE.
- B. Tests shall be a minimum of four hours in duration.
- C. Samples for each test shall be collected once every 15 minutes minimum and composited.
- D. Analytical results from the composite samples shall be less than 2 ppm PCBs to be acceptable.
- E. The average of the mean temperatures from the three acceptable tests measured at the exit of the desorption unit shall be computed. This average shall be the soil treatment temperature to be used in treating soil at this site.
- F. The automatic waste feed cut off (AWFCO) shall be 100°F below the soil treatment temperature with a five-minute delay. The 60-minute rolling average cannot be 70°F or greater below the soil treatment temperature at any time.

G. A confirmatory sample, a one-hour composite, shall be collected for analysis whenever significant rainfall occurs (for example: two-inches of rain during a 24-hour period or a 48-hour continuous heavy rainfall). Periods of dry weather requires confirmatory sampling (for example: for stockpiles, a two-weeks dry period or for ground soil, a four-week dry period). Covered stockpiles are exempt from this condition.

- (3) Documents used in estimating the frequency of change out of the carbon adsorption units and the results of the soil treatment temperature tests shall be compiled and made available for viewing by agency and regulatory personnel.

b. Operating Conditions and Interlocks.

Operation of the MSR HCI TDU is subject to the conditions expressed herein, and consistent with the materials and data included in HCI TDU application submitted to NPCD entitled "Permit Application for a Mobile PCB Treatment Unit" dated June 25, 2001, and "Demonstration Test Plan: High Capacity Indirect Thermal Desorption Unit with Optional Chemical Decomposition System" dated October 5, 2001.

- (1) Regulatory Interlocks: Feed to the HCI TDU shall immediately be shut off automatically for:

- A. Failure of the monitoring operations specified in Condition 6, with the exception of Condition 6.b., 6.c., 6.d. and 6.e.
- B. Failure of the recording equipment monitoring the PCB feed rate and quantity measuring and recording equipment failing as specified in Condition 6.a, must be immediately replaced by manual recording of the PCB feed rate.

- (2) Operating Conditions and Operational Interlocks: MSR shall operate the HCI TDU under the following conditions (including Table A) whenever PCBs are being treated:

- A. Soil Feed Rate: The set point for feeding of soil shall not exceed 20.1 tons/hour. An automatic waste feed cut off shall be set for the rate of change in feed at 23 tons/hour with a 5 minute delay. The soil feed rate shall not exceed 20.1 tons/hr on a 60-min rolling average. An AWFCO for the rolling average shall be set at 22.5 tons/hr with a 10-sec delay.
- B. Primary Carbon Adsorption Units: As an alternative to the monthly monitoring of the Primary Carbon unit for PCB using the NIOSH Method 5503g, MSR may develop a system using the heat of adsorption to estimate



the activity of the carbon. By measuring the temperature of the incoming gas stream and the exiting gas, the temperature difference ( $\Delta T$ ) between the incoming and exiting gas can be tracked and correlated to the point of PCB detection in the exit gas. When this  $\Delta T$  is established, MSR may use this procedure to monitor the exiting gas in conjunction with the NIOSH 5503 procedure. Then MSR shall install this  $\Delta T$  as an alarm, visually, audibly or both to proceed with the NIOSH 5503 monitoring procedure.

C. Operating Pressure: The target Thermal Desorber Face pressure is -0.50" wc (water column) nominally, with a 5-minute delay shutdown at -0.10" wc and a 10-second shutdown at 0" wc (see Table A). MSR must maintain a negative draft throughout the system sufficient to preclude fugitive emissions from the combustion chambers.

D. Oxygen Level: Oxygen emission ( $O_2$ ) levels shall vary from site to site and within the site according to types and levels of organic chemicals and biota. Soil chemistry may also affect oxygen levels through pyrolytic and degradation reactions of the organic chemicals and biota.

E. Carbon Monoxide Level: Carbon monoxide (CO) emission levels shall vary from site to site and within the site according to types and levels of organic chemicals and biota. Soil chemistry may also affect oxygen levels through pyrolytic and degradation reactions of the organic chemicals and biota. MSR shall comply with local and regional CO emission standards.

F. Induced Draft Fan: Malfunction of the ID fan shall activate an AWFCO with a 10-sec delay or a MWFCO.

G. Combustion Air: Failure of rotary blowers to primary combustion air shall activate an audio alarm and a AWFCO with a 5-minute delay or a MWFCO with a 5-minute delay.

H. PCB DRE Requirement: Whenever stack sampling is required, analysis must indicate that the destruction and removal efficiency (DRE) for PCBs in the HCI TDU system shall be a minimum of 99.9999% calculated as follows:

$$DRE = 100 \times \frac{\text{PCB Feed Rate In, lb/hr} - \text{PCB Stack Emissions, lb/hr}}{\text{PCB Feed Rate In, lb/hr}}$$

where PCB Feed Rate In = Feed Rate X PCB concentration; and  
PCB Stack Emissions = Stack Gas Volume Rate X PCB concentration

I. HCl & Particulate Matter: The particulate emission rate shall be less than 0.08 grains/dscf using the procedure given in 40 CFR 264.343 (c). The HCl emissions limit shall be the greater quantity of 4 pounds per hour or one percent of the HCl entering the pollution control system.

J Dioxins and Furans: Tentative operating criterion for emission concentration for polychlorodibenzodioxins and polychlorodibenzofurans (PCDD/PCDFs) is 1 ng/dscm expressed in toxic equivalent quotient (TEQ) of the congener 2,3,7,8-tetrachlorodibenzodioxin.

4. Analysis of Process Material and Residues: The following requirements (Condition 4) do not apply if the process residues are disposed of in EPA-approved facilities, including chemical waste landfills and Subtitle C landfills.

Representative samples of the treated material from each separate soil pile must be collected and analyzed in duplicate (i.e., duplicate analysis) by gas chromatography for PCB concentrations. Each soil pile ranges from 150 to 500 tons representing 12 to 30 hours of operations, depending on site operations. Any treated soil that is discovered to contain greater than 2 ppm PCB must be handled as if it contained the original concentration of PCBs of soil feed prior to processing. This material must be stored in an appropriate manner and reprocessed through the HCI TDU until process operations have indicated complete removal of PCBs (less than 2 ppm) or disposed of in an approved chemical waste landfill.

Waste material includes spent carbon filter media (both vapor and liquid phase), gas and liquid filter sludge and personnel protective equipment. All process solid waste exhibiting a level of PCB above 2 ppm chromatographic peak and aqueous waste above 3 ppb PCBs must be disposed of as if it contained the PCB level of the feedstock.

Should sampling of treated material or residue be required for polychlorinated dibenzodioxins and polychlorinated dibenzofurans (including 2,3,7,8-tetrachlorodibenzodioxins (TCDDs) and 2,3,7,8-tetrachlorodibenzofurans (TCDFs)) the analysis must be accomplished using laboratory techniques with detectable limits below 0.2 parts per billion (ppb).

Analytical Methods: The chemical analysis of PCBs requires use of gas chromatography. Any gas chromatographic method that is appropriate for the material being analyzed may be used,

**TABLE A**  
**MSR HCI TDU OPERATING SET POINTS AND INTERLOCKS**

PARAMETERS	SET POINT	INTERLOCKS (AWFCOs or MWFCO)	
		TIME DELAY	10-SEC DELAY
Monitor per Cond 6 except 6.b.,c.,f., and g.	Functioning	Malfunction, w. 3-min delay	
Record soil feed rate	Functioning	Malfunction, w. 3-min delay	
Primary Carbon Adsorption Units Carbon Replacement Frequency	Site specific	As described in Condition 3.b(2)B	
Polishing Carbon Adsorption Unit Carbon Replacement Frequency	Site specific	New Charge at New Site, per Condition 3.b(2)C	
Soil Treatment Exit Temperature	Site specific	See Condition 3.a(2)	
Soil Feed, Rate of Change	20.1 tons/hr	22.1 tons/hr, w. 5-min delay	30 tons/hr
Soil Feed, 60-min Rolling Average	20.1 tons/hr		22.1 tons/hr
Primary Carbon Adsorption Units, PCB Detection in Exit Gas	PCB Detection	PCB detected, immediate manual shutdown	
Polishing, Final Carbon Adsorption Unit	Not applicable		
Thermal Desorber Face Pressure, inches w.c.	- 0.5	- 0.10 5-min delay	0.0
Exhaust O <sub>2</sub> , %	Site specific	See Condition 3.b(E)	
Exhaust Gas CO, ppm	Site specific	See Condition 3.b(F)	
I.D. Fan	Functioning	Malfunction, MWFCO [3.b(G)]	AWFCO
Combustion Air	Blower Functioning	Malfunction, 5-minute delay	

including EPA Method 608, "Organochlorine Pesticides and PCBs" at 40 CFR part 136, Appendix A;" EPA Method 8082, "Polychlorinated Biphenyls (PCBs) by Capillary Column Gas Chromatography" of SW-846, "OSW Test Methods for Evaluating Solid Waste," which is available from NTIS, and ASTM Standard D-4059, "Standard Test Method for Analysis of Polychlorinated Biphenyls in Insulating Liquids by Gas Chromatography," which is available from ASTM..

5. Desorber Failure: If the quality control testing, as described below and in Conditions 4, reveals that after the first five composite samples (i.e. the first 40 hours of operation) the HCI TDU has not been able to achieve the required less than 2 ppm PCB residue in treated soil at the same time, then MSR must stop operations with the HCI TDU. The facility operator must notify the Fibers and Organics Branch (202) 566-0514 or by FAX at (202) 566-0473 during the business hours in Washington, D.C. and the EPA Regional Office on the day of the major system failure or, if failure does not occur during business hours, during the next regular business day, and file a written report within fifteen (15) days. The affected unit shall not resume operation until the problem has been corrected to the satisfaction of the EPA.

6. Monitoring and Recording: Provisions must be made to assure that the following process elements are suitably monitored and recorded for all PCBs processed, such that materials harmful to health or the environment are not inadvertently released:

- a. the rate of PCB-contaminated soil being fed to the HCI TDU shall be continuously monitored and electronically logged at least once every five minutes. In addition, the feed rate will be manually logged at least once every 30 minutes.
- b. the concentration of PCBs in the soil stockpile
- c. concentration of PCBs in each individual pile of treated material, including process wastes (the method of disposal and location of the disposal facility for each waste should be documented) (see Condition 4 for applicable conditions);
- d. temperature and pressure of desorption at least once during every half-hour interval;
- e. the desorber soil exit temperature shall be continuously measured and recorded,
- f. date, time and duration of each operation, and
- g. name, address, and EPA identification number of the facility.

The records must be compiled and maintained in accordance with the time(s) and location(s) specified in Condition 17.

7. Annual Quality Control Monitoring: Upon request from EPA, MSR shall conduct annual monitoring of the facility for PCBs destruction and removal efficiencies and HCl removal efficiency, and mass emission rates for particulates, 2,3,7,8-tetrachlorodibenzodioxin (TCDD), and 2,3,7,8-tetrachlorodibenzofuran (TCDF) and total polychlorinated dibenzodioxins and total polychlorinated dibenzofurans. This annual monitoring must be consistent with procedures outlined in SW-846, and may be part of an air permit compliance demonstration such as a State Air Permit. If the limits specified in the Conditions of Approval are not complied with, U.S. EPA must be notified within one day of receipt of the test results, and MSR shall cease PCB disposal operations. If no disposal operations were conducted during the year of an anniversary of this permit, EPA may request monitoring during the first disposal operation in the following year after the anniversary. All parameters shall be monitored as required under this condition.

8. PCB Releases: In the event MSR believes, or has reason to believe, that a fugitive release of PCBs other than stack gas emission has or might have occurred from the unit during processing, MSR must inform the appropriate EPA Regional Administrator or PCB Coordinators by phone immediately after remedial actions have been taken to ensure the protection of health and the environment.

A written report describing the incident must be submitted by the fifteenth (15th) business day after the day of the incident. No PCBs may be processed in that facility until the release problem has been corrected to the satisfaction of the EPA, as expressed in writing.

9. Spills: Any spills of PCBs or other fluids shall be promptly controlled and cleaned up as provided in the Spill Prevention, Control and Countermeasures Plan provided in the application and Demonstration Test plan. In addition, a written report describing the spill, operations involved, cleanup actions and changes in operation to prevent such spills in the future must be submitted to the appropriate EPA Regional Administrator within fifteen (15) business days. PCB spills must be reported in accordance with the PCB spill reporting requirements prescribed under Section 311 of the Clean Water Act for discharges to navigable waters and under the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) for discharges to other media.

10. Safety and Health: MSR must take all necessary precautionary measures to ensure that operation of the HCI TDU is in compliance with the applicable safety and health standards, as required by Federal, State and local laws and regulations and ordinances. Any lost-time injury occurring as a result of the operation of the HCI TDU must be reported to the PCB Disposal Site Coordinator in the appropriate EPA Regional Administrator by the next business day. A written report describing the accident must also be submitted within five business days.

11. Facility Security: The facility shall be secured (e.g., fence, alarm system, etc.) to ensure that only those individuals participating in the operations and approved visitors are allowed in the area.

12. Incident Notification: Any notification of an EPA Regional Administrator required by conditions (6),(7), (8), and (9) shall also be made by telephone to the NPCD (202) 566-0500 within the time frame specified. In addition, MSR shall file a written report with the Director, National Program Chemicals Division, Office of Pollution Prevention and Toxics, Office of Prevention, Pesticides and Toxic Substances, 1200 Pennsylvania Avenue N.W., Washington, D. C. 20460 within the time frame specified.

13. Waste Disposition: Process waste such as filter sludge must be disposed of as PCB waste pursuant to 40 CFR 761 unless it is established through representative sampling that the material contains levels of PCBs less than 2 ppm by individual congeners or less than 2 ppm total PCBs if the analytical chromatogram indicates Aroclor patterns. PCB-contaminated equipment on the MSR unit may be transferred off-site only in accordance with the U.S. Department of Transportation (DOT) requirements at 49 CFR Subchapter C as applicable. Such requirements include placarding the equipment if the unit is not decontaminated after use.

14. Agency Approvals/Permits: No operation may commence until MSR has obtained all necessary approvals/permits from Federal, State and local agencies. MSR is responsible for obtaining such approvals/permits.

15. Personnel Training: MSR shall be responsible for ensuring that personnel directly involved with the handling or disposal of PCB-contaminated soil using the HCI TDU are demonstrably familiar with the general requirements of this approval. At a minimum, the general requirements must include:

- a. the disposal of solid PCBs which may be treated using the HCI TDU, and the expected upper limit of PCB contamination which may be treated;
- b. basic recordkeeping requirements under this approval and the location of records;
- c. notification requirements;
- d. waste disposal requirements for process and by-product wastes generated during the operation of the HCI TDU;
- e. safety, operation, and maintenance procedures;
- f. procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;
- g. spill prevention and cleanup plan; and
- h. reporting requirements.

In this regard, MSR must maintain on-site during the operations of its unit a copy of this approval; the Spill Prevention, Control and Countermeasure plan; and sampling and analytical procedures, as Condition 4 requires, used to determine PCB concentrations of soil. In addition, a copy of the sampling and analytical procedures must be maintained in the laboratory conducting the analysis.

16. Financial Assurance: MSR shall incorporate financial assurance of closure and liability coverage provisions into its closure plan. These provisions must be equivalent to those specified in 40 CFR Part 264, Subpart H of the Resource Conservation and Recovery Act (RCRA), and provide funds for proper closure of the mobile PCB disposal units and support operations including all PCB storage facilities.

Before MSR starts permitted operations at any other facility, MSR must submit in writing site closure financial assurance provisions and documentation of financial assurance for accident liability. These provisions addressing specific sites must be submitted to the Director, National Program Chemicals Division for the Office of Pollution Prevention and Toxics. EPA will review these generic provisions to determine if they are acceptable. EPA will notify MSR of any deficiencies in the closure plan.

MSR must submit in writing annual updates to the Director, National Programs Chemicals Division of the financial assurance of closure and liability coverage provision described herein.

17. Recordkeeping: MSR shall collect and maintain for a period of five years from the date of the demonstration the following information:

- a. Continuous and short interval data described below:
  - (1) Rate and quantity of PCBs fed to the thermal desorption system;
  - (2) Soil exit temperature;
  - (3) Carbon replacement operations, date, time, quantity, and carbon manufacturer and grade.
- b. Data and records on the monitoring of desorption efficiency as required by these conditions.
- c. The total weight in kilograms of any solid residues generated by the HCI TDU during operations, and the total weight in kilograms of any solid residues disposed by the facility as required by this approval.
- d. The name and address of each client whose PCBs were processed by the HCI TDU.
- e. A copy of each gas chromatogram, including QC requirements such as relevant standards and blanks, from the test required by Conditions 2 and 4.
- f. The date(s) time and duration of the operations.
- g. The name, address and telephone number of the operator and supervisor.
- h. An annual report shall be submitted to U.S. EPA Headquarters and to the appropriate EPA Regional Office by 60 days after each anniversary of the effective date of this permit. The annual report shall include information required in Conditions 17c, through 17g. Included in the report shall be the results of monitoring required in Condition 6.

The documents must be compiled within 60 days following completion of the treatment; must be kept at one centralized location; and must be available for inspection by authorized representatives of the EPA upon request. MSR must also maintain the records required by 40 CFR 761.180(f). If MSR terminates operation of the HCI TDU, these records or their copies must be submitted to the Director of the Office of Pollution Prevention and Toxics, USEPA.

18. Ownership or Operational Transfer: MSR must notify EPA at least 30 days before transferring ownership or operations responsibility of the MSR PCB HCI TDU(s). MSR must also submit to EPA, at least 30 days before such transfer, a notarized affidavit signed by the transferee which states that the transferee will abide by MSR's EPA approval. It is MSR's responsibility to include in the notification: the name, the address, phone number, and other pertinent information about the transferee. MSR must also submit a report of permitted disposal activities, including quantities and concentrations of PCB materials treated; proof that generated wastes have been appropriately disposed; certification that any MSR facilities, where disposal

equipment and/or supplies have been kept/maintained, will be appropriately cleaned/removed before the transfer; and a description of exactly what part (equipment and/or operating staff) of MSR will be transferred. In order for the MSR EPA approval to be transferred and prior to conducting any PCB disposal operations, the transferee must provide financial assurance for closure and liability relevant to the type of activities in MSR approval.

Within thirty days of receiving such notification and affidavit, EPA may issue an amended approval substituting the transferee's name for MSR name, or may require the transferee to apply for a new PCB disposal approval. In the latter case, the transferee must submit a demonstration test plan for EPA review and upon approval perform a demonstration at a site with materials of PCB concentration proposed by the transferee and approved by EPA. Should MSR and the transferee fail to provide EPA with the required written documentation related to the sale or ownership or operations responsibility transfer and/or to provide this documentation within the specified time frame, this permit shall be null and void upon sale or transfer of the unit..

19. Additional HCI TDU Units: MSR must file a written pre-operation report with the Director for National Program Chemicals Division of the Office of Pollution Prevention and Toxics within thirty (30) days from the date of construction of each additional HCI TDU to be operated in the United States. This report should contain the following information:

- a. date of construction of the unit;
- b. identification of the new HCI TDU unit;
- c. certification by an independent, registered professional engineer to the effect that the HCI TDU is substantially identical to the original demonstrated system in terms of engineering design, hardware, process capacity, quality and workmanship;
- d. certification by the chief executive officer of MSR signifying that the new HCI TDU system has been completed in such manner; and
- e. a list of all non-substantive changes made to the design and construction of the new HCI TDU system which are not identical to the original HCI TDU .

20. Major Modifications: No major modifications may be made to the MSR HCI TDU design or operations, as described in the application and demonstration plan for this approval, without prior written approval of the National Programs Chemical Division (NPCD). NPCD may require the submission of any information necessary to evaluate the request for a major modification. For the purpose of this approval, "major modification" means any change to capacity, design, efficiency, waste type, or any other changes affecting overall performance or environmental impact. A major modification includes any modification that may affect the characteristics of the stack emission products. After such a modification, the operator must monitor stack emissions and report stack emission concentrations for the following parameters:



- a. Oxygen, O<sub>2</sub>
- b. Carbon monoxide, CO
- c. Carbon dioxide, CO<sub>2</sub>
- d. Nitrogen oxides, NO<sub>x</sub>
- e. Hydrochloric acid, HCl
- f. Total chlorinated organic content, RCI
- g. PCBs
- h. Total particulate matter

21. Approval Severability: The conditions of this approval are severable, and if any provision of this approval or any application of any provision is held invalid, the remainder of this approval shall not be affected thereby.

22. Approval Effective Date: This approval shall expire five calendar years from the date the permit becomes effective. For an approval renewal, EPA may require additional information and/or testing of the MSR HCI TDU . In order to continue the effectiveness of this approval pending EPA action on reissuance, MSR must submit a renewal request letter to EPA at least 90 calendar days, but not more than 180 calendar days, prior to the expiration date of this approval.

APPROVAL

1. Approval to dispose of PCBs is hereby granted to Midwest Soil Remediation, Inc. (MSR), Elgin, Illinois, subject to the conditions expressed herein, and consistent with the materials and data included in the permit application filed by the company. EPA reserves the right to impose additional conditions when it has reason to believe that the continued operation of the HCI TDU unit presents an unreasonable risk to public health or the environment or to implement any changes to the Toxic Substances Control Act or the implementing PCB regulations. Any such proposed additional conditions shall be preceded by reasonable advance notice to MSR and opportunity for MSR to comment on the proposed modifications.

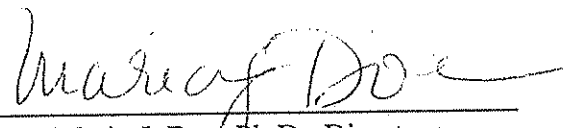
Any departure from the conditions of this approval or the terms expressed in the application must receive prior written authorization of the Director, National Program Chemicals Division, Office of Pollution Prevention and Toxics, USEPA. In this context, "application" shall be defined as all data and materials which have been received by this Agency from MSR regarding the HCI TDU.

2. This approval to dispose of PCBs does not relieve MSR of the responsibility to determine and comply with all applicable Federal, State and local laws and regulations. Violations of any applicable regulations will be subject to enforcement action, and may result in termination of this approval. This approval may be modified or terminated at any time for failure to comply with the terms and conditions herein, failure to disclose all relevant facts, or for any other reasons which the Director, National Program Chemicals Division deems necessary to protect health or the environment.

3. MSR shall be responsible for the actions of any authorized HCI TDU employees when those actions are within the scope of operating or moving the Process, and shall assume full responsibility for compliance with all applicable Federal, State and local laws and regulations including, but not limited to, any advance or emergency notification and accident reporting requirements.

4. EPA reserves the right for its employees or agents to inspect the HCI TDU and PCB disposal activities at any location or reasonable time.

9/13/04  
Date

  
\_\_\_\_\_  
Maria J. Doal Ph.D., Director  
National Program Chemicals Division

## APPENDIX 1

### BACKGROUND

Midwest Soil Remediation, Inc. (MSR) specializes in on-site removal and treatment of contaminated soil. The company is located in Elgin, Illinois. On behalf of MSR, TD\*X Associates of Research Triangle, North Carolina submitted the TSCA PCB Disposal Approval Application and Demonstration Plan pursuant to 40 CFR 761.60(e) for an alternative PCB disposal technology. MSR will demonstrate their High Capacity Indirect (HCI) Thermal Desorption Unit (TDU) for approval to dispose of PCBs. The MSR TSCA Permit Application (operating permit) and Demonstration Test Plans were submitted June 25, 2001 and October 5, 2001, respectively.

MSR demonstrated their HCI TDU during January 2003 at the Warren County PCB Landfill Detoxification Project near Warrenton, North Carolina. The North Carolina Department of Natural Resources (NCDENR) had oversight responsibility over the landfill detoxification project.

MSR also applied for a PCB Chemical Decomposition System that MSR intended to use to treat on site the organic condensate collected from the HCI TDU prior to its offsite recycling or disposal. However, MSR did not demonstrate the USEPA's patented Base Catalyzed Decomposition (BCD) chemical treatment technology to remove PCBs from the organic condensate. Therefore, NPCD does not approve the BCD process for PCB disposal.

### FINDINGS

1. The Midwest Soil Remediation, Inc. (MSR) High Capacity Indirect (HCI) Thermal Desorption Unit (TDU) is a mobile treatment unit to dispose of non-liquid PCBs. The HCI-TDU removes PCBs from contaminated soil. Components of the HCI-TDU include the following

- a. Material feed system;
- b. Indirectly heated dryer;
- c. Materials discharge system;
- d. Gas condensate recovery system;
- f. Condensate oil treatment system.

Process Description: The HCI-TDU is a transportable alternative PCB treatment system.. The unit separates PCBs from soils, sludges and similar solids and recovers them with a condensation style gas treatment system. The unit's primary dryer is indirectly heated, with the PCB contaminated material inside its rotating sealed steel cylinder and the burners firing in a stationary external furnace. The combustion gases never touch the PCB waste and are discharged to atmosphere. PCBs have been shown to be non-detectible in the unit's process vent, with the resulting equivalent destruction and removal efficiency (DRE) being greater than 99.9999%.

The liquid organic condensate contains the PCBs and other organic chemicals from the waste and is disposed at a separately permitted offsite facility, typically at a TSCA approved incinerator. The treated solids have less than 2 ppm residual PCBs and are released from regulation under TSCA and normally backfilled at the project site.

2. This approval also applies to an optional PCB Chemical Decomposition System that MSR may use to treat the organic condensate on site prior to its offsite recycling or disposal. MSR will be using the USEPA's patented Base Catalyzed Decomposition (BCD) chemical treatment technology to remove PCBs from the organic condensate with this optional system. If the treated organic condensate has less than 2

ppm PCBs, it will be released from regulation under TSCA, and recycled or disposed at an appropriate facility. If the treated organic condensate has more than 2 ppm PCBs, it will be managed at a TSCA approved facility based on either the original PCB level of the waste, or its current PCB level, whichever is greater.

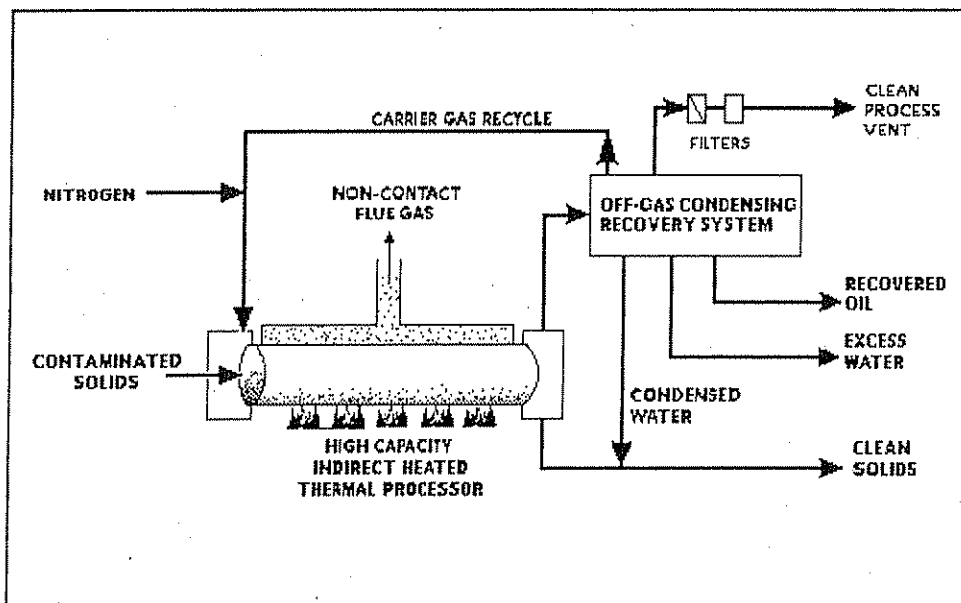


Figure 1. MSR HCI TDU Process Flow Diagram

3. EPA categorizes the MSR HCI TDU an alternative PCB disposal technology. Specifically, the HCI TDU is an alternate PCB thermal disposal process. Therefore, MSR must demonstrate the HCI TDU to be equivalent to a PCB incinerator pursuant to 40 CFR 761.70. Incinerators meeting these criteria have been shown not to present an unreasonable risk to human health or the environment. The currently accepted performance level for EPA-approved incinerators is 99.9999% destruction and removal efficiency (DRE) for PCBs.

4. Many of the HCI TDU operating parameters are computer controlled. Should a malfunction occur, the HCI TDU is designed to automatically shut down. Alternatively, some shutdown sequences may be initiated by manual activation.

5. Due to the design aspects, operating parameters, and safety measures, EPA finds that a demonstration of the MSR HCI TDU system is equivalent to a demonstration of a 40 CFR 761.70 incinerator and that the demonstration does not pose an unreasonable risk of injury to health or the environment.

6. PCDD/PCDF Emissions Criteria: The current level of 2,2',4,4'-TCDD TEQ emissions from full scale incinerators is 0.2 ng/m<sup>3</sup>. Because the MSR exhaust gas flow is at least two orders of magnitude smaller than a commercial incinerator, EPA believes it is appropriate to impose the previously proposed PCDD/PCDF emission standard of 1 ng/m<sup>3</sup> for hazardous waste incinerators until separate standards for small incinerators are developed.

**SUMMARY OF RESULTS FROM THE PCB DISPOSAL DEMONSTRATION  
AT THE WARREN COUNTY LANDFILL, WARRENTON, NC  
JANUARY 7 - 9, 2003**

**TABLE 1. PCB DISPOSAL DEMONSTRATION SUMMARY****Table 1a Operating Conditions**

Thermal Desorber Operating Data	RUN 2	RUN 3	RUN 4	AVG
Soil Feed Rate, tons/hr	18.0	19.7	20.5	19.4
Soil Exit Temperature °F (avg)	802	779	773	785
Treated Soil, ppm PCB	<2	<2	<2	<2
Thermal Desorber Pressure, in. w.c.	-0.11	-0.09	-0.10	-0.10
Stack Gas Flow Rate, acfm	0.114	0.111	0.101	0.108
Stack Gas Flow Rate, dscfm	0.117	0.107	0.095	0.106
Isokinetic Sampling Ratio, %	95.5	95.5	98.9	96.6

**Table 1b PCBs DRE and HCl**

Parameters	RUN 2	RUN 3	RUN 4	AVG
Soil PCB Level, ppm	855.7	748	773	792
Spike PCB Concentration, ppm	0	204,000	178,200	191,100 <sup>A</sup>
Spike Feed Rate, lb/hr	0	229.5	334.6	282.1 <sup>A</sup>
Total PCB Flow Rate, lb/hr	27.28	73.05	89.16	81.1 <sup>A</sup>
PCB Stack Emissions Rate, lb/hr	3.86E-07	9.41E-07	4.01E-07	5.76E-07
PCB Stack Emissions Rate, gm/sec	4.86E-08	1.19E-07	5.05E-08	7.27E-08
PCB DRE, %	99.9999986	99.9999987	99.9999996	99.9999990
HCl Emission Rate, lb/hr	5.25E-05	3.23E-05	4.36E-05	4.28E-05

**Table 1c Supplementary Test Results**

Parameter	Units	Run 1 Pre-Test	Run 2	Run 3	Run 4
Date		8/26/02	01/07/03	01/08/03	01/09/03
Time			10:05 to 14:25	11:00 to 15:00	10:05 to 14:25
Feed Soil PCB	mg/kg dwb	546.8	1,002	748	773
Feed Total Solids	%	92	90.8%	87.5%	93.0%
Soil Feed Rate	ton/day	301.0	432.29	472.8	493
Spike PCB	mg/kg	0	0	204,000	178,200
Spike Feed Rate	lb/day	0	0	5508	8031
PCB Conc of Feed	mg/kg	546.8	1,002	2,092	2,315
PCB Feed Rate, Total	lb/hr	12.62	32.78	82.90	95.88
Vent Rate	dscfm	52	117	107	101
PCB emission rate	lb/hr	1.23E-07	3.86E-07	9.41E-07	4.01E-07
DRE	%	99.9999991	99.9999986	99.9999987	99.9999996
HCl emission rate	lb/hr	-	5.25E-05	3.23E-05	4.36E-05
Treated Product Temperature	°F	Min. Avg. Max.	732 803 879	751 779 839	684 773 1,020
Desorber Internal Pressure	Inches WC	Min. Avg. Max.	-0.31 -0.11 -0.01	-0.23 -0.09 -0.05	-0.18 -0.10 -0.03
Condenser Outlet Temperature	°F	Min. Avg. Max.	47 42 54	50 45 58	60 44 179
O <sub>2</sub> Concentration in Recycle Loop	%	Min. Avg. Max.	0.0 0.4 4.0	0.1 0.5 1.0	0.0 0.7 5.4

TABLE 2 PCB EMISSIONS

PCB Homologues	Run 2	Run3	Run 4
MonoChloroBiphenyls			
Concentration, ng/dscm	57.8619	57.5874	75.0455
Emission Rate, lb/hr	2.54E-08	2.30E-08	2.68E-08
DiChloroBiphenyls			
Concentration, ng/dscm	34.3555	51.6301	25.7299
Emission Rate, lb/hr	1.51E-08	2.07E-08	9.20E-09
TriChloroBiphenyls			
Concentration, ng/dscm	43.3965	101.2743	64.3247
Emission Rate, lb/hr	1.91 E-08	4.05E-08	2.30E-08
TetraChloroBiphenyls			
Concentration, ng/dscm	84.9847	196.591	113.6403
Emission Rate, lb/hr	3.73E-08	7.86E-08	4.07E-08
PentaChloroBiphenyls			
Concentration, ng/dscm	166.3531	397.1543	235.8573
Emission Rate, lb/hr	7.31 E-08	1.59E-07	8.44E-08
HexaChloroBiphenyls			
Concentration, ng/dscm	325.4734	913.4548	385.9484
Emission Rate, lb/hr	1.43E-07	3.65E-07	1.38E-07
HeptaChloroBiphenyls			
Concentration, ng/dscm	141.0385	516.3006	214.4158
Emission Rate, lb/hr	6.19E-08	2.07E-07	7.67E-08
OctaChloroBiphenyls			
Concentration, ng/dscm	23.5064	113.1890	4.0739
Emission Rate, lb/hr	1.03E-08	4.53E-08	1.46E-09
NonaChloroBiphenyls			
Concentration, ng/dscm	1.0849	5.7587	1.4366
Emission Rate, lb/hr	4.77E-10	2.30E-09	5.14E-10
DecdaChloroBiphenyls-209			
Concentration, ng/dscm,	0.7052	0.0000	0.0000
Emission Rate, lb/hr	3.10E-10	0.00E+00	0.00E+00
Total PCBs			
Concentration, ng/dscm	878.7601	2352.9405	1120.4724
Emission Rate, lb/hr	3.86E-07	9.41 E-07	4.01 E-07
<b>Field Blanks</b>			
Total DiChloroBiphenyls - Field Blank			
Concentration, ng/dscm,	0.2351	0.2582	0.2787
Emission Rate, lb/hr	1.03E-10	1.03E-10	9.97E-11
Total HexaChloroBiphenyls - Field Blank			
Concentration, ng/dscm,	0.1989	0.2184	0.2359
Emission Rate, lb/hr	8.74E-11	8.74E-11	8.44E-11

Note 1. Run VENT-23-1 (1/9/03), Sample run duration is indicated as 240 minutes (4 hours). The total run time was 265 minutes due to the 25 minute extension as a result of system operational difficulty of 25 minutes during the test. The volume recorded during the down time was backed out of the total sample volume. Thus, a conservative concentration value is provided due to a reduced overall air volume.

Note 2. PCB values are reported by STL Sacramento.

Note 3. When analysis results indicated values below reporting limits (AL), a value of zero (0) was used in the calculation to determine concentration.

Note 4. Field Blank analysis showed results for DiCBs and HxCBs (1.3 and 1.1 ng respectively). These values were subtracted off of the total results for each run.

FIELD BLANK DATA (Note 5)

Note 5. Field Blank analysis showed results for DiCBs and HxCBs (1.3 and 1.1 ng respectively).

Because the field blank has no associated flow or other physical data, the concentration has been applied to the physical data for each of the three runs to estimate a mass emission rate associated with that run.

**TABLE 3 DIOXINS/FURANS****Table 3a. 2,3,7,8 TCDD TEQ Emissions**

<u>Parameters</u>	<u>RUN 2</u>	<u>RUN 3</u>	<u>RUN 4</u>	<u>AVG</u>
Concentration, ng/dscm	3.07E-04	1.35E-03	1.11E-02	4.25E-03
Emission Rate, gm/sec	1.69E-12	6.75E-10	1.85E-10	2.87E-10
Emission Rate, lb/hr	1.34E-11	5.36E-09	1.47E-09	2.28E-09

**Table 3b. Dioxins/Furans Emissions by Congeners and Homologues**

<b>PCDDs</b>	<b>Run 2</b>	<b>Run 3</b>	<b>Run 4</b>
<b>2378 TCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>Total TCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>12378 PeCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>Total PeCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>123478 HxCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>123678 HxCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>123789 HxCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>Total HxCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>1234678 HpCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>Total HpCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>12346789 OCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
<b>Total PCDD</b>			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND

Table 3b. Dioxins/Furans Emissions by Congeners and Homologues, (cont'd)

PCDFs	Run 2	Run 3	Run 4
2378 TCDF			
Concentration, ng/dscm	3.07E-03	1.35E-02	5.15E-03
Emission Rate, lb/hr	1.35E-06	5.40E-06	1.84E-06
Total TCDF			
Concentration, ng/dscm	1.27E-02	8.94E-02	3.22E-02
Emission Rate, lb/hr	5.56E-06	3.57E-05	1.15E-05
12378 PeCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
23478 PeCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
Total PeCDF			
Concentration, ng/dscm	ND	1.99E-02	ND
Emission Rate, lb/hr	ND	7.94E-06	ND
123478 HxCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
123678 HxCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
123789 HxCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
123678 HxCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
123789 HxCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
Total HxCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
1234678 HpCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
1234789 HpCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
Total HpCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
12346789 OCDF			
Concentration, ng/dscm	ND	ND	ND
Emission Rate, lb/hr	ND	ND	ND
Total PCDF			
Concentration, ng/dscm Emission	1.57E-02	1.23E-01	3.73E-02
Rate, lb/hr	6.91E-06	4.91E-05	1.33E-05

ng=Nanograms

ng/dscm=Nanograms per dry standard cubic meter lb/hr= Pounds per hour.

Note: All results have been Field Blank corrected, but have not been corrected for oxygen since the source is not considered a combustion source.



TABLE 4 VOLATILE ORGANIC EMISSION

Volatile Organics	Run 2		Run 3		Run 4				
	Vost 1	Vost 2	Vost 3	Vost 4	Vost 5	Vost 6	Vost 7	Vost 8	Vost 9
Acetone									
Concentration, mg/dscm <sup>a</sup>	5.05E+00	1.07E+01	3.83E+01	9.62E+00	2.27E+01	1.09E+02	6.40E+02	1.27E+03	1.62E+03
Emission Rate, lb/hr <sup>b</sup>	2.22E-03	4.71E-03	1.68E-02	3.85E-03	9.11E-03	4.36E-02	2.28E-01	4.53E-01	5.77E-01
Acetonitrile									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	ND	ND	ND	{1.96E+03}	4.21E+02	ND
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	ND	ND	ND	{6.98E-01}	1.50E-01	ND
Benzene									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	4.73E+00	1.31E+01	2.33E+01	1.59E+02	2.74E+02	3.24E+02
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	{1.90E-03}	{5.25E-03}	{9.34E-03}	{5.65E-02}	{9.76E-02}	{1.15E-01}
Bromomethane									
Concentration, mg/dscm <sup>a</sup>	4.41E+00	1.25E+01	2.46E+01	3.46E+00	1.06E+01	3.21E+01	2.66E+01	2.58E+01	3.14E+01
Emission Rate, lb/hr <sup>b</sup>	1.94E-03	{5.48E-03}	{1.08E-02}	1.39E-03	{4.24E-03}	{1.29E-02}	9.47E-03	{9.19E-03}	{1.12E-02}
1,3-Butadiene									
Concentration, mg/dscm <sup>a</sup>	{9.31E+00}	{2.34E+01}	{3.25E+01}	1.73E+01	1.32E+01	8.38E+02	6.09E+02	4.73E+02	3.82E+02
Emission Rate, lb/hr <sup>b</sup>	{4.09E-03}	{1.03E-02}	{1.43E-02}	{6.94E-03}	{5.28E-03}	{3.36E-01}	{2.17E-01}	{1.68E-01}	{1.36E-01}
2-Butanone									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	ND	ND	ND	ND	ND	5.25E+00
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	ND	ND	ND	ND	ND	{1.87E-03}
Carbon disulfide									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	6.73E+00	1.23E+01	1.60E+01	9.29E+00	1.07E+01	1.22E+01
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	{2.70E-03}	{4.92E-03}	{6.42E-03}	{3.31E-03}	{3.82E-03}	{4.33E-03}
Chloromethane									
Concentration, mg/dscm <sup>a</sup>	{2.75E+01}	1.58E+02	2.20E+02	{2.20E+00}	2.42E+01	2.93E+01	{2.98E+01}	1.57E+01	2.26E+01
Emission Rate, lb/hr <sup>b</sup>	{1.21E-02}	{6.96E-02}	{9.65E-02}	{8.83E-04}	{9.69E-03}	{1.18E-02}	{1.06E-02}	{5.58E-03}	{8.06E-03}
n-Hexane									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	2.27E+01	3.68E+01	5.34E+01	1.78E+02	1.75E+02	1.86E+02
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	{9.08E-03}	{1.48E-02}	{2.14E-02}	{6.33E-02}	{6.23E-02}	{6.62E-02}
2-Hexanone									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	6.25E-03	ND	ND	ND	ND	ND
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	{2.51E-06}	ND	ND	ND	ND	ND
Iodomethane									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	1.92E+00	3.91E+00	ND	ND	ND	ND
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	{7.71E-04}	{1.57E-03}	ND	ND	ND	ND
Methylene chloride									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	ND	3.41E+00	2.43E+00	4.20E+01	2.13E+00	2.34E+00
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	ND	1.37E-03	9.73E-04	1.50E-02	7.57E-04	8.32E-04
Naphthalene									
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	1.83E+00	1.82E+00	2.27E+01	1.73E+00	2.17E+01	2.33E+01
Emission Rate, lb/hr <sup>b</sup>	ND	ND	ND	{7.33E-04}	{7.29E-04}	{9.11E-03}	{6.15E-04}	{7.71E-03}	{8.28E-03}

TABLE 4 VOLATILE ORGANIC EMISSION (cont'd)

Volatile Organics	Run 2		Run 3		Run 4	
	Vost 1	Vost 2	Vost 3	Vost 4	Vost 5	Vost 6
Toluene						
Concentration, mg/dscm <sup>a</sup>	ND	ND	ND	ND	ND	ND
Emission Rate, lb/hr <sup>b</sup>	ND	ND	{5.90E-01}	ND	{5.14E-01}	{3.10E+00}
1,2,3-Trichlorobenzene			{2.37E-04}	ND	{1.83E-04}	{1.10E-03}
Concentration, mg/dscm <sup>a</sup>	8.93E-01	1.96E+00	7.78E+00	1.49E+00	1.36E+00	1.55E+01
1,66E+01						
Emission Rate, lb/hr <sup>b</sup>	3.92E-04	{8.61E-04}	{3.42E-03}	5.98E-04	{5.47E-04}	{6.23E-03}
03} {5.94E-03}						

<sup>a</sup> Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.<sup>b</sup> Parts per billion by volume.<sup>c</sup> Pounds per hour.

ND Not Detectable - Results are below target analyte detection limit. Values are counted as zero (0) in averages.

{ } Estimate - Analyte results are below the quantitation limit and above the detection limit. Values are counted in the averages.

Table 4a. Volatile Organic Compounds Not Detected

Acrylonitrile	2-Chlorotoluene	trans-1,2-Dichloroethene	n-Propylbenzene
Bromobenzene	4-Chlorotoluene	1,2-Dichloropropane	Styrene
Bromochloromethane	1,2-Dibromo-3-chloropropane	1,3-Dichloropropane	1,1,1,2-Tetrachloroethane
Bromodichloromethane	1,2-Dibromoethane	2,2-Dichloropropane	1,1,2,2-Tetrachloroethane
Bromoform	Dibromomethane	1,1-Dichloropropane	Tetrachloroethene
n-Butylbenzene	1,2-Dichlorobenzene	cis-1,3-Dichloropropene	1,1,2-Trichloro-1,2,2-trifluoroethane
Sec-Butylbenzene	1,3-Dichlorobenzene	trans-1,3-Dichloropropene	1,2,4-Trichlorobenzene
Tert-Butylbenzene	1,4-Dichlorobenzene	Ethylbenzene	1,1,1-Trichloroethane
Carbon tetrachloride	1,4-Dichloro-2-butene (total)	Hexachlorobutadiene	1,1,2-Trichloroethane
Chlorobenzene	Dichlorodifluoromethane	Isopropylbenzene	Trichloroethene
Chlorodibromomethane	1,1-Dichloroethane	p-Isopropyltoluene	1,2,4-Trimethylbenzene
Chloroethane	1,2-Dichloroethane	4-Methyl-2-pentanone	1,3,5-Trimethylbenzene
Chloroform	1,1-Dichloroethene	Methyl tert-butyl ether	Vinyl chloride
2-Chloropropane	cis-1,2-Dichloroethene	2-Propanol	

**TABLE 5 SEMI-VOLATILE ORGANIC EMISSION**  
**WARREN COUNTY LANDFILL REMEDIATION PROJECT**  
 January 2003

<u>Run2</u>	<u>Run 3</u>	<u>Run Average</u>			
1,4-Dichlorobenzene					
Concentration, mg/dscm <sup>a</sup>	ND	8.54E-03	ND	2.85E-03	
Emission Rate, lb/hr <sup>c</sup>	ND	3.42E-06	ND	1.14E-06	

<sup>a</sup> Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

<sup>b</sup> Parts per billion by volume.

<sup>c</sup> Pounds per hour.

Note: Compounds with results higher than the detection limit are indicated in bold.

**Table 5a Semi-Volatile Organics Emissions**  
**List of Compounds not detected**

Acenaphthene	Dibenzofuran	Isophorone
Acenaphthylene	Di-n-butylphthalate	2-Methylnaphthalene
Anthracene	1,2-Dichlorobenzene	2-Methylphenol
Benzo(a)anthracene	1,3-Dichlorobenzene	3/4-Methylphenol
Benzo(b)fluoranthene	3,3'-Dichlorobenzidine	Naphthalene
Benzo(k)fluoranthene	2,4-Dichlorophenol	2-Nitroaniline
Benzo(ghi)perylene	Diethyl phthalate	3-Nitroaniline
Benzo(a)pyrene	2,4-Dimethylphenol	4-Nitroaniline
bis-(2-Chloroethoxy)methane	Dimethyl phthalate	Nitrobenzene
bis-(2-Chloroethyl)ether	4,6-Dinitro-2-methylphenol	2-Nitrophenol
bis-(2-Chloroisopropyl)ether	2,4-Dinitrophenol	4-Nitrophenol
bis-(2-Ethylhexyl)phthalate	2,4-Dinitrotoluene	n-Nitrosodiphenylamine
4-Bromophenyl phenyl ether	2,6-Dinitrotoluene	n-Nitrosodi-n-propylamine
Butyl benzyl phthalate	Di-n-octyl phthalate	Pentachlorophenol
4-Chloroaniline	Fluoranthene	Phenanthrene
4-Chloro-3-methylphenol	Fluorene	Phenol
2-Chloronaphthalene	Hexachlorobenzene	Pyrene
2-Chlorophenol	Hexachlorobutadiene	1,2,4-Trichlorobenzene
4-Chlorophenyl phenyl ether	Hexachlorocyclopentadiene	2,4,5-Trichlorophenol
Chrysene	Hexachloroethane	2,4,6-Trichlorophenol
Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	

TABLE 6 MULTI METALS EMISSION

Metals	Run 2	Run 2 Dup	Run 3	Run 4	Metals	Run 2	Run 2 Dup	Run 3	Run 4
Aluminum					Manganese				
Concentration, µg/dscm	14.88	15.09	0.23	0.00	Concentration, µg/dscm	0.0	0.0	1.1	0.8
Emission Rate, lb/hr	6.52E-06	6.61E-06	9.19E-08	0.00	Emission Rate, lb/hr	0.00	0.00	4.50E-07	2.86E-07
Antimony					Mercury				
Concentration, µg/dscm	0.00	0.00	0.00	0.00	Concentration, µg/dscm	0.0	0.0	0.0	0.3
Emission Rate, lb/hr	0.00	0.00	0.00	0.00	Emission Rate, lb/hr	0.00	0.00	0.00	9.70E-08
Arsenic					Nickel				
Concentration, µg/dscm	0.00	0.00	1.11	5.31	Concentration, µg/dscm	0.0	0.0	0.1	0.0
Emission Rate, lb/hr	0.00	0.00	4.41E-07	1.90E-06	Emission Rate, lb/hr	0.00	0.00	4.60E-08	0.00
Barium					Phosphorous				
Concentration, µg/dscm	0.3	0.3	0.2	0.3	Concentration, µg/dscm	0.4	0.0	4.7	3.9
Emission Rate, lb/hr	1.23E-07	1.32E-07	6.43E-08	1.16E-07	Emission Rate, lb/hr	1.61E-07	0.00	1.88E-06	1.40E-06
Beryllium					Potassium				
Concentration, µg/dscm	0.00	0.00	0.00	0.00	Concentration, µg/dscm	0.0	0.0	0.0	0.0
Emission Rate, lb/hr	0.00	0.00	0.00	0.00	Emission Rate, lb/hr	0.00	0.00	0.00	0.00
Boron					Selenium				
Concentration, µg/dscm	0.34	0.28	0.00	0.00	Concentration, µg/dscm	0.0	0.1	106.4	420.9
Emission Rate, lb/hr	1.51E-07	1.23E-07	0.00	0.00	Emission Rate, lb/hr	0.00	6.33E-08	4.25E-05	1.50E-04
Cadmium					Silver				
Concentration, µg/dscm	0.0	0.0	0.0	0.0	Concentration, µg/dscm	0.05	0.05	0.00	0.00
Emission Rate, lb/hr	0.00	0.00	0.00	0.00	Emission Rate, lb/hr	2.27E-08	2.27E-08	0.00	0.00
Calcium					Sodium				
Concentration, µg/dscm	58.2	34.5	36.8	57.6	Concentration, µg/dscm	20.7	20.3	19.8	14.0
Emission Rate, lb/hr	2.55E-05	1.51E-05	1.47E-05	2.06E-05	Emission Rate, lb/hr	9.07E-06	8.88E-06	7.90E-06	5.01E-06
Chromium					Strontium				
Concentration, µg/dscm	0.0	0.0	1.9	1.2	Concentration, µg/dscm	0.00	0.00	0.00	0.00
Emission Rate, lb/hr	0.00	0.00	7.54E-07	4.29E-07	Emission Rate, lb/hr	0.00	0.00	0.00	0.00
Cobalt					Thallium				
Concentration, µg/dscm	0.0	0.0	0.2	0.3	Concentration, µg/dscm	0.0	0.0	0.0	0.0
Emission Rate, lb/hr	6.61E-09	7.56E-09	8.27E-08	8.94E-08	Emission Rate, lb/hr	0.00	0.00	0.00	0.00
Copper					Tin				
Concentration, µg/dscm	0.0	0.0	1.0	0.0	Concentration, µg/dscm	0.0	0.0	0.5	0.3
Emission Rate, lb/hr	0.00	0.00	4.04E-07	0.00	Emission Rate, lb/hr	0.00	0.00	1.84E-07	1.16E-07
Iron					Titanium				
Concentration, µg/dscm	5.17	5.17	12.21	1.95	Concentration, µg/dscm	0.3	0.3	0.7	0.4
Emission Rate, lb/hr	2.27E-06	2.27E-06	4.87E-06	6.97E-07	Emission Rate, lb/hr	1.32E-07	1.13E-07	2.94E-07	1.43E-07
Lead					Vanadium				
Concentration, µg/dscm	0.00	0.00	0.00	0.00	Concentration, µg/dscm	0.0	0.0	0.0	0.0
Emission Rate, lb/hr	0.00	0.00	0.00	0.00	Emission Rate, lb/hr	0.00	0.00	0.00	0.00
Magnesium					Zinc				
Concentration, µg/dscm	3.1	3.0	0.5	0.0	Concentration, µg/dscm	0.1	0.1	2.2	1.9
Emission Rate, lb/hr	1.35E-06	1.31E-06	1.93E-07	0.00	Emission Rate, lb/hr	4.72E-08	4.72E-08	8.64E-07	6.79E-07

TABLE 7. AMBIENT AIR MONITORING RESULTS FOR VOCs, PCB, TEQ PCDD, PM-10  
PRE-ACTIVITY PERIOD COMPARED TO SHAKEDOWN PERIOD

Parameters	North Carolina Guide-lines	Background Monitoring May 29-June 1, 2001				Shakedown Test #1, August 26-29, 2002			
Volatile Organic Compounds (VOCs)	Units	Ambient Air Monitoring Stations				Ambient Air Monitoring Stations			
		South (Station 1)	East (Station 2)	North (Station 2)	Co-located (Station 1)	South (Station 1)	East (Station 2)	North (Station 3)	Co-located (Station 3)
Freon 12	mg/m <sup>3</sup>	ND	ND	ND	ND	0.0028	0.0042	0.0060	NP
Vinyl Chloride	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
Freon 11	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	0.0031	NP
Freon 113	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
Chloroform	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	0.0037	NP
Benzene	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
Carbon Tetrachloride	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
Toluene	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
Methylene Chloride	mg/m <sup>3</sup>	ND	0.0330	ND	0.0041	ND	0.0042	0.0080	NP
Chlorobenzene	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	0.0033	0.0671	NP
Xylenes	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
Styrene	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
1,1,2,2-Tetrachloroethane	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
Trichloroethene	mg/m <sup>3</sup>	ND	ND	ND	ND	0.0049	ND	ND	NP
Tetrachloroethene	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
1,4-Dichlorobenzene	mg/m <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	NP
Methyl Chloride	mg/m <sup>3</sup>	ND	ND	ND	ND	0.0012	0.0016	0.0012	NP
Total PCBs	mg/m <sup>3</sup>	ND	ND	ND	ND	3.2x10 <sup>-5</sup>	1.4x10 <sup>-5</sup>	2.2x10 <sup>-5</sup>	1.4x10 <sup>-5</sup>
TE Dioxin/Furan	mg/m <sup>3</sup>	1.5x10 <sup>-13</sup>	8.0x10 <sup>-11</sup>	8.2x10 <sup>-12</sup>	1.9x10 <sup>-11</sup>	2.6x10 <sup>-10</sup>	8.7x10 <sup>-11</sup>	3.6x10 <sup>-11</sup>	NP
PM-10									
- Annual Average	ug/m <sup>3</sup>	15	15	13	15	29	8	3	19
- 24-hour Average	ug/m <sup>3</sup>	15	15	13	15	29	8	3	19

TABLE 8. AMBIENT AIR QUALITY MONITORING RESULTS

Table 8a. Total PCBs

Date(s)	Event	Downwind Station(s)	Station #1 (South)	Station #2 (East)	Station #3 (North)
8/26 - 8/28/02	Shakedown #1	North/East	3.2E-05	1.4E-05	1.8E-05
10/28 - 10/30/02	Shakedown #2	South	7.4E-05	3.7E-06	3.9E-06
11/23 - 11/25/02	Shakedown #3	North/East	3.4E-05	1.5E-04	1.3E-04
1/7 - 1/9/03	PCB Demo #1	East	2.0E-06	7.1E-05	9.9E-05
1/9 - 1/11/03	PCB Demo #2	East	1.5E-05	9.8E-05	5.6E-05
1/14 - 1/15/03	Full Operation	North	4.1E-05	1.4E-05	2.1E-05
1/15 - 1/16/03	Full Operations	East	5.0E-05	2.4E-05	2.2E-05
Average Concentration (mg/m <sup>3</sup> )			3.5E-05	5.4E-05	5.0E-05

- NCDENR Ambient Air Limit - 8.3E-05 mg/m<sup>3</sup> (annual)

Table 8b. Dioxins/Furans

Date(s)	Event	Downwind Station(s)	Station #1 (South)	Station #2 (East)	Station #3 (North)
8/26 - 8/28/02	Shakedown #1	North/East	2.6E-10	8.7E-11	3.6E-11
10/28 - 10/30/02	Shakedown #2	South	6.2E-09	2.7E-11	7.9E-11
11/23 - 11/25/02	Shakedown #3	North/East	2.7E-10	6.2E-09	1.9E-09
1/9 - 1/11/03	PCB Demo #2	East	3.1E-10	6.2E-09	9.0E-10
1/14 - 1/15/03	Full Operation	North	1.2E-10	1.4E-11	9.7E-11
1/15 - 1/16/03	Full Operations	East	3.9E-12	7.8E-11	9.8E-12
Average Concentration, mg/m <sup>3</sup>			1.0E-09	2.1E-09	5.7E-10

NCDENR Ambient Air Limit - 3.0E-09 mg/m<sup>3</sup> (annual)

Table 8c. Particulate

Date(s)	Event	Downwind Station(s)	Station #1 (South)	Station #2 (East)	Station #3 (North)
8/26 - 8/28/02	Shakedown #1	North/East	29	8	11
10/28 - 10/30/02	Shakedown #2	South	77	56	6
11/23 - 11/25/02	Shakedown #3	North/East	15	25	20
1/7 - 1/9/03	PCB Demo #1	East	10	56	40
1/9 - 1/11/03	PCB Demo #2	East	43	34	21
1/14 - 1/15/03	Full Operation	North	54	22	17
1/15 - 1/16/03	Full Operations	East	19	17	13
Avg Concentration (mg/m <sup>3</sup> )			35	31	18

NCDENR Ambient Air Limit - 50 µg/m<sup>3</sup> (annual) and 150 µg/m<sup>3</sup> (24 hr)

Appendix II

\*\*\*\*\*

EXAMPLE THIRTY DAY NOTIFICATION FORM FOR PART A

Company Name, Address, Phone Number, and Contact Person:

Person, Organizational Affiliation/Title, and Phone Number for:

EPA Regional Contact:

State Contact:

Local (Town/City/County) Contact:

Nature of the Disposal Activity:

Kind of PCB Disposal Process:

Kinds of Material Containing PCBs:

Numbers and Sizes of Pieces of Equipment Containing PCBs:

Quantity of Solids and/or Volume of Liquids Containing PCBs:

Concentration(s) of PCBs in the Material to be Treated:

Location

Street Address or Other Identifier for All Facilities:

Telephone Contact and Address for Site Manager:

Time of Processing

Date(s):

Time(s):

\*\*\*\*\*

Enclosure





APPENDIX IIA

\*\*\*\*\*

SAMPLE MIDWEST SOIL REMEDIATION PROCESS  
30-DAY ADVANCE NOTIFICATION FORM

Client Name:  
Client Address:

Midwest Contact:  
Phone:

Contact:  
Phone:

Type of PCB Disposal Activity:

Amount and Type of PCB Material:

PCB Concentration Range:

Scheduled Time(s) and Date(s):

Contacts and Phones:

EPA - Wash., D.C.  
Hiroshi Dodohara  
1200 Pennsylvania Ave. N.W.  
Wash., D.C. 20460  
202-566-0507

EPA Region

State Agency

Local

Site Locations:

\*\*\*\*\*

Enclosure

## APPENDIX IIB

\*\*\*\*\*

### SAMPLE MIDWEST SOIL REMEDIATION PROCESS TWO WEEK ACTIVITY SCHEDULE FORM

Period Covered:

EPA Region	Most Probable Operating Date	Scheduled Date(s) & No. of Time(s)	County(s) of Operation or Central Location & Sites	Contact Phone No.
---------------	---------------------------------------	---	---	-------------------

Week No. 1:

Week No. 2:

\*\*\*\*\*

Enclosure

## APPENDIX IIC

\*\*\*\*\*

### SAMPLE THIRTY DAY NOTIFICATION FORM FOR CONDITION NO. 1

Company Name, Address, Phone Number, and Contact Person:

Person, Organizational Affiliation/Title, and Phone Number for:

EPA Regional Contact:

State Contact:

Local (Town/City/County) Contact:

Nature of the Disposal Activity:

Kind of PCB Disposal Process:

Kinds of Material Containing PCBs:

Numbers and Sizes of Pieces of Equipment Containing PCBs:

Quantity of Solids and/or Volume of Liquid(s) Containing PCBs:

Concentration(s) of PCBs in the Material Treated:

Location

Street Address or Other Identifier for All Facilities:

Telephone Contact and Address for Facility Manager:

Time of Processing

Date(s):

Time(s):

\*\*\*\*\*

Enclosure